

CLAIMS

1. A device for distracting and supporting two substantially opposing tissue surfaces in a patient's body, to be introduced within the tissue surfaces in a minimally invasive procedure, the device comprising:
a wrapping element; and
an expandable structure insertable between the two substantially opposing support surfaces of the wrapping element, adapted to be expanded between the two substantially opposing surfaces to a predetermined dimension.
2. The device as claimed in Claim 1, further provided with a conduit, through which it is introduced into the patient's body.
3. The device as claimed in Claim 1, further provided with an introduction member, the introduction member comprising a substantially linear conduit, having a proximal end through which the device is inserted and a distal end where two substantially opposite slots are provided, through which the expandable structure may protrude in directions substantially perpendicular to the conduit.
4. The device as claimed in Claim 3, wherein the wrapping element comprises an adjustable strap interlaced through slits that are provided on the introduction member.
5. The device as claimed in Claim 1, wherein the wrapping element comprises two substantially opposing support surfaces.
6. The device as claimed in Claim 5, wherein the two substantially opposing support surfaces are ragged on internal sides.

7. The device as claimed in Claim 6, wherein at least one of the two substantially opposing support surfaces is provided with a protrusion for providing anchorage for the expandable structure when it is positioned between the two substantially opposing support surfaces.

8. The device as claimed in Claim 6, wherein the expandable structure comprises a plurality of beams.

9. The device as claimed in Claim 1, wherein the expandable structure comprises a segmented strip made of a series of jointed segments pivotally interconnected so as to present a multi-joint strip, each segment having an elongated bore provided on it through which a fastener may be interlaced, for holding the strip in a folded state of a desired height.

10. A device for distracting and supporting two substantially opposing tissue surfaces in a patient's body, to be introduced within the tissue surfaces in a minimally invasive procedure, the device comprising:

a segmented strip made of a series of jointed segments pivotally interconnected so as to present a multi-joint strip, each segment having an elongated bore provided on it through which a fastener may be interlaced, for holding the strip in a folded state of a desired height.

11. The device as claimed in Claim 1, wherein the expandable structure is an initially squashed deployable polyhedron structure.

12. The device as claimed in Claim 10, wherein the polyhedron structure has a cross section in the form of a parallelogram.

13. The device as claimed in Claim 10, in a dual configuration.
14. The device as claimed in Claim 1, wherein the expandable structure comprises two foldable straps placed on either sides of a bar.
15. The device as claimed in Claim 1, wherein the expandable structure comprises a coil.
16. The device as claimed in Claim 15 wherein the coil comprises a coiled strap.
17. The device as claimed in Claim 16, further provided with a harness arrangement with two substantially parallel bars pivotally connected to an introducing conduit and coupled to an axle for the strap to be coiled on, allowing upward or downward motion of the coil with respect to the conduit.
18. The device as claimed in Claim 16, wherein the coiled strap is coiled over a rotor.
19. The device as claimed in Claim 16, wherein the device includes a propulsion belt for driving the strap and enhancing its coiling.
20. The device as Claimed in Claim 19, further provided with a roller for rolling the propulsion belt.
21. The device as claimed in Claim 19, wherein the belt is provided with ragged surface for enhancing friction between the belt and the coil.

22. The device as claimed in Claim 19, wherein the strap is provided with a ragged surface for enhancing friction between the belt and the coil.
23. The device as claimed in Claim 1, wherein the expandable structure comprises a plurality of cylindrical elements.
24. The device as claimed in Claim 23, wherein the cylindrical elements are provided with cog-like surface.
25. The device as claimed in Claim 23, wherein the cylindrical elements are provided with threading.
26. The device as claimed in Claim 23, wherein the cylindrical elements are linked.
27. The device as claimed in Claim 26, wherein the cylindrical elements are linked loosely by links that can break up when the linked cylindrical elements are pressed within the wrapping element.
28. The device as claimed in Claim 26, wherein the cylindrical elements are linked by a string.
29. The device as claimed in Claim 1, wherein the wrapping is incorporated with the expandable structure.
30. The device as claimed in Claim 1, wherein the wrapping is incorporated with an introduction device used to introduce the device to a target location.

31. The device as claimed in Claim 1, made from materials selected from: metal, titanium, titanium alloy, stainless steel alloys, steel 316, processed foil, hydroxyapatite, material coated with hydroxyapatite, plastics, silicon, composite materials, carbon-fiber, hardened polymeric materials, polymethylmetacrylate (PMMA), ceramic materials, coral material or a combination thereof.

32. A plate for use in an assembly for distracting and supporting two opposing tissues, the assembly comprising at least one of a plurality of plates, the plate comprising a flexible structure made from a strap.

33. The plate as claimed in Claim 32, wherein the strap forms a structure having substantially two opposing surfaces and a portion of the strap in between the surfaces in a wavy formation.

34. The plate as claimed in Claim 33, wherein portions of the strap form wedge-like ends located on either sides of the substantially opposing surfaces.

35. A device for distracting and supporting two substantially opposing tissue surfaces in a patient's body substantially as described in the present specification and accompanying drawings.